

ABSTRACT

When defects of a fine pattern are detected, it is difficult to achieve sufficient detection accuracy since conventional optical systems do not have sufficient defect detection sensitivity for small contrast of an optical image in the fine pattern part. To solve this problem, focusing attention on improving the contrast in the fine pattern part, the present invention acquires the image of the sample that has high contrast both in large and fine pattern parts by using an optical system for coaxial bright field epi-illumination, forming the optical image of the sample with various transmission ratio of 0-th order diffracted light that is reflected regularly from the sample, and capturing the image by an image sensor. Further, it is possible to set optical conditioning automatically and in a short time by detecting a plurality of optical images of the sample under various conditions for the transmission ratio of the 0-th order diffracted light, evaluating quality of the detected images, and determining the transmission ratio of the 0-th order diffracted light showing the maximum defect detection sensitivity.